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There were two causes for this failure. First, the stability was deficient, as subsequently recognized, and second, Mr. Maxim did not and could not know how to handle it in the air, for lack of preliminary practise in free flight. The gradual training which all successful aviators have had to go through during the last five years is an abundant demonstration, and one of the marvels of the evolution is that so few fatal accidents have occurred to the experimenters, although there have been almost innumerable breakages of the machines.

O. CHANUTE

Our Insect Friends and Enemies. By JOHN B. SMITH, ScD., Professor of Entomology in Rutgers College and Entomologist of the New Jersey Agricultural Experiment Station. Philadelphia, J. B. Lippincott Company. 1909. Pp. 314, 1 plate. \$1.50.

The many good insect books which have appeared during the past few years have not entirely filled the need for more literature of the right sort. A careful reading of this book shows it to be quite different in scope from any of its predecessors. The object is not to present a scheme of classification, a manual of insect anatomy, or a handbook of injurious species of insects, yet these phases are treated incidentally and satisfactorily.

In the foreword the author explains that his object has been to present an account of the relation of insects to other living things. In this he has been eminently successful, and it would be difficult indeed in a book of its size to give a more comprehensive and complete general survey of the whole subject. To the student and working entomologist this book is useful, but especially to the lay reader who sometimes gets an exaggerated idea of the value of parasites or remedial measures in destroying noxious species, is this volume of great value because it shows these relations in their true light and perspective.

The average individual has little knowledge about the recent discoveries relating to the transmission of human and other animal diseases by insects, especially flies, mosquitoes and fleas. In fact, his only source of information has been the newspapers, which print oc-

casional disjointed statements regarding this very important matter. Chapter IX. makes this subject plain to anyone who will read it—and everybody ought to read it.

Chapters IV. and V., on the relation of insects to each other and their relation to animals, are particularly good and deserve to have a wide reading.

A critical person might question the statement regarding the formation of galls on page 78: "and the remarkable point is, that the gall is purely a production of the plant, and the insect has apparently nothing at all to do with it." That the irritation, stimulus or injury of the insect which causes a gall of definite and characteristic shape to form on a particular plant is little known, is true, yet it can not be considered that the insect has "apparently nothing at all to do with it," when the attack of each different species of Cynipidæ or Cecidomyidæ causes a different but entirely characteristic gall to form on the same host plant. However, this is partly explained below on the same page by Professor Smith.

A good colored plate of household insects forms the frontispiece to the volume, which is well printed on good paper, and attractively bound in tan-colored linen.

Of the 121 figures in the text about 35 are new, and were made from excellent pen drawings.

The book is remarkably free from typographical or other errors, the only one noticed being the mis-spelled specific name of the Angoumois grain moth *Gelechia cerealella* Oliv., on page 242.

This volume should find a place in every library of entomological works, and every public library should have a copy.

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NOTES ON ENTOMOLOGY

MR. G. H. VERRALL has completed another volume in the series of books on the Diptera of Great Britain.¹ This volume includes all

¹ "British Flies," Vol. V., London, 1909, 780 pp., 406 figs.

of the Brachycera except the Empidæ, Dolichopodidæ, Lonchopteridæ and Phoridæ. He gives the characters of all the subfamilies and important European genera, whether occurring in England or not. His arrangement of the brachycerous Diptera is based on that of Osten Sacken, but with several important modifications. It is as follows: Eremochæta (Stratiomyidæ, Leptidæ, Tabanidæ, Nemestrinidæ and Cyrtidæ); Tromoptera (Bombylidæ and Therevidæ); Dermatina (Scenopinidæ and Mydæidæ); Ernegopoda (Apioceridæ and Asilidæ); Microphona (Empidæ and Dolichopodidæ); Acroptera (Lonchopteridæ), and Hypocera (Phoridæ). He puts *Xylomyia* in the Stratiomyidæ and *Xylophagus* in the Leptidæ. In the Asilinæ he uses the various genera proposed, but, recognizing the difficulty of their identification, he also gives a table of the British species based on superficial characters. An important feature is an illustrated article on the larvæ of the Brachycera, and of the Syrphidæ, Platypezidæ and Pipunculidæ by David Sharp, partly translated from Brauer. In the back is a list of the species common to Europe and North America, and as a supplement a catalogue of the Palearctic Diptera Brachycera (except Dolichopodidæ and Empidæ).

DR. L. G. NEUMANN has issued a useful little book on the parasites and diseases of domestic birds.² It contains much interesting matter on the insects and mites that attack poultry and pigeons, arranged according to the parts affected. There is a short description of each parasite, the nature and appearance of the injury it causes, and the remedies that may be used to combat it. Most of the figures of these forms are original and accurate.

DRS. J. W. W. STEPHENS and S. R. Christophers have prepared a book³ that will be of much help and interest to the many who are now concerned in the study of medical entomology. The entomological part is in two

chapters on ticks, one on tsetse flies, etc., and fifteen chapters on mosquitoes. In the latter are directions for collecting, rearing, dissection, etc. There are chapters on How to Prepare a Blood Film, How to Detect the Malaria Parasite, How to Make a Malarial Survey, on the Life-history of the Malarial Parasite, on Piroplasma and on Trypanosoma and the diseases produced by them.

DR. J. KENNEL has begun the issuance of a large work on the European Tortricid moths.⁴ Part I. is published, and contains an account of the structure, habits, life-history and variability of the leaf-rollers, and a table for the determination of the 55 genera. There is a long account of the relationships of the genera, and the phylogeny of the groups, illustrated by a plate of wing venation. The systematic part treats of the 43 species of *Acalla*, while the beautiful plates figure the species of this genus and those of *Philedone*, *Epagoge* and *Cacæcia*. There are to be 24 plates in the entire work, which is partially supported by a grant from the Elizabeth Thompson Science Fund.

MR. E. P. VAN DUZEE has published the results of a recent collecting trip to Florida.⁵ Over 330 species were taken, 28 of which are described as new. He finds that the hemipterous fauna of Florida is made up of four elements: (1) the Carolinian, which spread southward from the Georgia mountains; (2) the West Indian, which has extended over the tip of Florida and up each coast; (3) a few forms from Texas and Mexico; and (4) the endemic species, which are very numerous, and largely local adaptations of the Carolinian migrants.

PROFESSOR C. T. VORHIES has issued a useful paper dealing with the immature stages of some Wisconsin caddice-flies.⁶ The larvæ of

⁴ "Die Palæarktischen Tortriciden, Zoologica," Hft. 54, 1908, 4to, 6 pls., 100 pp.

⁵ "Observations on Some Hemiptera taken in Florida in the Spring of 1908," *Bull. Buffalo Soc. Nat. Hist.*, IX., pp. 149-230, 1909.

⁶ "Studies on the Trichoptera of Wisconsin," *Trans. Wisc. Acad. Science*, XVI., pp. 647-718, 10 pls., 1909.

² "Parasites et Maladies parasitaires des Oiseaux domestiques," Paris, 1909, 230 pp., 89 figs.

³ "The Practical Study of Malaria, and Other Blood Parasites," London, 1908, 414 pp., 128 figs.

these aquatic insects are but little known in this country, and Professor Vorhies has made a good start in describing 18 species that he reared to adult. Six species are considered new. The figures show the structural characters of the larvæ and also of some of the adults.

THE larvæ of gnats of the genus *Chironomus* have often been studied by naturalists, but not the least interesting is a posthumous paper by A. T. Mundy.⁷ The part on the anatomy of the head seems to be particularly well done. There are detailed accounts of the making of the larval tubes, and a summary of the habits of allied *Chironomus* larvæ.

THE largest volume so far published on the "Collections Zoologiques du Baron Edm. de Selys Longchamps" is Fascicle VIII., a monograph of the Ascalaphidæ⁸ by H. van der Weele. The de Selys collection is particularly rich in this family, possessing many types of Latreille and Rambur. About 200 species are now known, arranged in 50 genera, and the author has had peculiar facilities in studying specimens in many museums and collections. To the two former subfamilies, Schizophthalminæ and Holophthalminæ, he adds a new subfamily, Protascalaphinæ, for *Stilbopteryx* and *Albardia*.

In this same series René Martin has published two fascicles (XIX., XX.) on the dragon-flies of the group *Æschnines*, completing the account of this family. There are about 185 species in 28 genera, mostly belonging to *Æschna* or *Gynacantha*. Many species are described as new, especially from Mr. Martin's collection.

NATHAN BANKS

SPECIAL ARTICLES

AN EXPERIMENT IN MUSICAL ESTHETICS

In the field of psychology, few subjects offer as many difficulties to the investigator as that of esthetics, and in the realm of esthetics, few

⁷ "The Anatomy, Habits and Psychology of *Chironomus pusio* Meigen (the Early Stages)," Leicester, England, 1909, pp. 56, 8 plates.

⁸ "Ascalaphiden," Monographisch Bearbeitet, 326 pp., 254 figs., 2 col. plates, Brussels, 1909.

topics are more obscure than those that relate to the art of music.

Problems in musical esthetics, by their very nature, can not be adequately understood without taking account of both their psychological and their purely musical aspects. Unfortunately for the solution of such problems, however, the psychologist and the musician, in too many instances, not only fail to cooperate in their studies, but even lack an appreciative and sympathetic understanding of each other's methods and conclusions. We are much in need of two-handed men, equipped in both directions—or else, of intimate collaboration between the investigators in the separate fields.

Largely because of a lack of just such collaboration, the subject of musical dissonance has been invested with an atmosphere of uncertainty and confusion, in the minds of both psychologists, estheticians and musicians. The difficulties inhere, particularly, in ambiguous definitions of the word *dissonance* itself—definitions to which we have become so accustomed that, as a rule, we fail to notice their inadequacy. Among various uncertain and shifting meanings assigned to the term, two fairly defined conceptions present themselves: (1) a dissonance is a combination of simultaneous tones that *sounds harsh*; (2) a dissonance is a combination of simultaneous tones that *requires resolution* (*i. e.*, creates a feeling of unrest, removable only when the given combination of tones is followed by a more or less prescribed other combination). Either of these definitions is feasible and adequate, in itself; the confusion arises from the fact that, even among men usually careful of their terminology, the word *dissonance* is employed, first in the one sense and then in the other.

It seems to the present writer that the term *dissonance* will be both more nearly exact in its meaning, and more useful to the musician, if it be defined, simply, as a combination of simultaneous tones that *sounds harsh* (psychologically, the sensation produced by such a combination). Under the terms of this definition, the only dissonant intervals are those known as *seconds* and *sevenths*; and the only